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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/751,086	12/29/2000	Shigeru Yoneda	P/1909-144	5593

7590 10/31/2003

Steven I. Weisburd, Esq.  
Dickstein Shapiro Morin & Oshinsky LLP  
1177 Avenue of the Americas  
41st Floor  
New York, NY 10036-2714

EXAMINER

KIANNI, KAVEH C

ART UNIT PAPER NUMBER

2877

DATE MAILED: 10/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/751,086

Applicant(s)

YONEDA, SHIGERU

Examiner

Kevin C Kianni

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 August 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. Claim 1 is objected to because of the following informalities: in the 12<sup>th</sup> line of claim 1, in page 2, the word 'said' is redundant. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over combination of Inoue et al. (US 6,304,687) and Yamada et al. (US 5,940,548).

Regarding claim 1, Inoue teaches a temperature -independent arrayed waveguide grating (shown at least in fig. 8 and 18; see col. 1, lines 10-20), comprising at least an input waveguide (see fig. 18, array 41), an input slab waveguide 44 including an input side and an output side (see fig. 18, input slab 44, at the left, with its input/output sides), said input side of said input slab waveguide 44 receiving light from said input waveguide (see fig. 18, item 45), a plurality of arrayed waveguides 41 including an input side and an output side (see fig. 18, item 41), said input side of said plurality of arranged waveguides being connected to said output side of said input slab waveguide 44 (see fig. 18, item waveguides are attached to the output side of the input slab waveguide, at the left), an output slab waveguide 44 including an input side and an

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output side (shown in fig. 18, items slab 44, at the right, with input/output sides), said input side of said output slab waveguide being connected to said output side of said arrayed waveguides (shown in fig. 18, item input side of the output slab waveguide 44, at the right, is connected to the output side of arrayed waveguides), a plurality of output waveguides connected to said output side of said output slab waveguides (see fig. 18, item waveguides, at the far right, connected to the output side of the output slab waveguides 44); a wedge-shaped groove 48 formed in said arrayed waveguides (see fig. 18, item 48 and 41; col. 11, lines 33-39); and a material filled in said groove (see fig. 18, item 48 and 41; col. 11, lines 33-44), said material having a negative refractive index temperature coefficient (see col. 3, lines 30-35 and col. 11, lines 33-45); wherein said material disposed in said groove confines light incident to said groove in a vertical and a horizontal direction thereby preventing the light from spreading in said groove (see col. 11, lines 25-44 and col. 16, lines 27-44; wherein the TE and TM mode represent the horizontal and vertical propagation of light confined by the material inside the groove to reduce the temperature dependency of the wavelength characteristic in light waveguide circuit, see col. 3, lines 7-11).

However, Inoue does not specifically teach that the above underlined material is a photosensitive material. Nevertheless, Inoue states that the above material can be a polymer compound (see col. 8, lines 8-41+). This limitation more specifically taught by Yamada et al. (Yamada). Yamada teaches arrayed-waveguide grating with a material inserted in a wedge-shaped groove 48 formed in said arrayed waveguides (shown at least in fig. 12, (shown at least in fig. 12) in which the material is a photosensitive

material having a negative refractive index coefficient (see col. 14, lines 45-50). Thus, Yamada provides the functions of controlling the variations in birefringence, the dispersion and adjusting the optical path length error (see col. 3, lines 5-24). Thus, it would have been obvious to a person of ordinary skill in the art when the invention was made to modify Inoue' material inside the wedge-shaped groove 48 with that of Yamada's photosensitive material in order to produce a an arrayed-waveguide grating that includes the above limitations, since the resultant arrayed-waveguide grating would whose optical characteristic does not depend on a temperature and that the loss of light is minimized (see col. 1, lines 10-21 and col. 4, lines 549-61).

Regarding claim 2, as stated in rejection of claim 1, Inoue further teaches wherein: a difference in a refractive index is provided in said material using the photosensitivity, and optical waveguides are thereby formed in said material in a horizontal direction or in vertical and horizontal directions (see fig. 37 items 11 and 12; see also abstract and at least col. 16, lines 26-44 and line 59-col. 17, line 4).

Regarding the prior art teaching of the limitation photosensitive material, the arguments presented in rejection of claim 1, are analogous to arguments for rejection of claim 2.

Regarding claim 3, as stated in rejection of claim 1, Inoue further teaches wherein said material filled in said groove has a refractive index higher than that of material of said arrayed waveguide grating (see col. 16, line 59-col. 17, line 4).

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Regarding the prior art teaching of the limitation photosensitive material, the arguments presented in rejection of claim 1, are analogous to arguments for rejection of claim 3.

Regarding claim 4, as stated in rejection of claim 1, Inoue further teaches wherein width of each core of said arrayed waveguides is enlarged before and after said groove (see fig. 37, item waveguide 36 and groove 12; also col. 16, lines 26-44).

Regarding claim 5, as stated in rejection of claim 1, Inoue further teaches wherein said material filled in said groove has a refractive index higher than that of material of said arrayed waveguide grating; and difference in a refractive index is provided in said material using the photosensitivity and optical waveguides are thereby formed in said material in a vertical direction or in vertical and horizontal directions (see fig. 37 items 11 and 12; see also abstract and at least col. 16, lines 26-44 and line 59-col. 17, line 4). Regarding the prior art teaching of the limitation photosensitive material, the arguments presented in rejection of claim 1, are analogous to arguments for rejection of claim 5.

Regarding claim 6, as stated in rejection of claim 1, Inoue further teaches wherein said material filled in said groove has a refractive index higher than that of material of said arrayed waveguide grating (see col. 16, line 59-col. 17, line 4); and width of each core of said arrayed waveguides is enlarged before and after said groove (see fig. 37, item waveguide 36 and groove 12; also col. 16, lines 26-44). Regarding

the prior art teaching of the limitation photosensitive material, the arguments presented in rejection of claim 1, are analogous to arguments for rejection of claim 6.

### ***Response to Amendment***

4. Applicant's arguments filed on July 09, 2003 have been fully considered and thus the examiner has used a new reference in combination with Inoue to overcome the applicant's amendment/arguments.

This examiner has carefully reexamined claims 1-6 in view of applicant's amendments and arguments.

Regarding Applicant's assertion (page 4, 3<sup>rd</sup>-4<sup>th</sup> parag.) that Inoue does not teach 'a photosensitive polymer' having a negative refractive index temperature coefficient filled in the groove, the examiner states that this limitation is more specifically taught by a new reference Yamada et al. (see at least col. 14, lines 45-50), thereby the combination of Inoue and Yamada, as discussed above, teach all limitations of claims 1-6.

### ***Citation of Relevant Prior Art***

5. Prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In accordance with MPEP 707.05 the following references are pertinent in rejection of this application since they provide substantially the same information disclosure as this patent does. These references are:

Inoue JP411038239A teaches array waveguide grating with photosensitive material

These references are cited herein to show the relevance of the apparatus/methods taught within these references as prior art.

**Contact Information**

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Cyrus Kianni whose telephone number is (703) 308-1216. The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (703) 308-4881.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

(703) 872-9306 (for formal communications intended for entry)

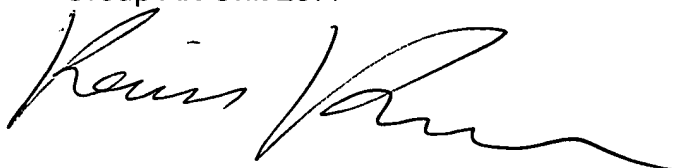
**or:**

Hand delivered responses should be brought to Crystal Plaza 4, 2021 South Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

Kevin Cyrus Kianni  
Patent Examiner  
Group Art Unit 2877

October 27, 2003

A handwritten signature in black ink, appearing to read 'Kevin Kianni', with a long horizontal flourish extending to the right.



U.S. DEPARTMENT OF COMMERCE

PATENT AND TRADEMARK OFFICE

EXAMINER'S CASE ACTION WORKSHEET

Application No.  
09/751,086



Legal Instrument Examiner

CHECK TYPE OF ACTION

DATE OF COUNT

<input checked="" type="checkbox"/> Non-Final Rejection	<input type="checkbox"/> Restriction/Election Only	<input type="checkbox"/> Final Rejection
<input type="checkbox"/> Ex Parte Quayle	<input type="checkbox"/> Allowance	<input type="checkbox"/> Advisory Action
<input type="checkbox"/> Examiner's Answer	<input type="checkbox"/> Reply Brief Noted	<input type="checkbox"/> Non-Entry of Reply Brief
<input type="checkbox"/> Defective Notice of Appeal	<input type="checkbox"/> Interference Disposal SPE _____ (Approval for Disposal)	<input type="checkbox"/> Suspension (Examiner-Initiated) SPE _____ (initial)
<input type="checkbox"/> Defective Appeal Brief	<input type="checkbox"/> SIR Disposal (use only after FAOM)	<input type="checkbox"/> Supplemental Examiner's Amendment
<input type="checkbox"/> Miscellaneous Office Letter (With Shortened Statutory Period Set)	<input type="checkbox"/> Notice of Non-Responsive Amendment (With One Month Time Period set)	<input type="checkbox"/> Miscellaneous Office Letter (No Response Period Set)
<input type="checkbox"/> Abandonment after BPAI Decision	<input type="checkbox"/> Supplemental Action (excluding Examiner's Answer)	<input type="checkbox"/> Response to Rule 312 Amendment
<input type="checkbox"/> Letter Restarting Period for Response (e.g., Missing References)	<input type="checkbox"/> Interview Summary	<input type="checkbox"/> Authorization to Change Previous Office Action SPE: _____ (Initial)
<input type="checkbox"/> Abandonment	<input type="checkbox"/> Express Abandonment Date: _____	<input type="checkbox"/> Other Specify: _____

Examiner's Name: Kevin C Kianni

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